REMARKS

Claims 1–5, 15, 16, 19, 20 and 22–29, and 35–37 are pending.

Claims 1–5, 15, and 16 are allowed.

Rejection of Claims Under 35 U.S.C. §112, first paragraph

The remaining rejections rest on whether the specification discloses that peripheral melanocortin receptors other than MC2-R and MC5-R have a role in regulating body weight and energy homeostasis.

1. Written Description Requirement Rejection

Claims 19–20, 22–29, and 35-37 are rejected under 35 U.S.C. §112, first paragraph, for failing to satisfy the written description requirement.

The Examiner agrees that the melanocortin receptors MC1-R through MC5-R are described in the specification and that the expression of the MC1-R and MC3-R receptors was previously known. However, the Examiner alleges that the specification does not shed any insight into the role of these receptors in regulating body weight and energy homeostasis.

A. The specification teaches the role of **peripheral** melanocortin receptors in regulating body weight and energy homeostasis.

At the time of Applicants' invention, pharmacological evidence pointed to the importance of a melanocortinic pathway in the central regulation (i.e. via the central nervous system) of energy balance, as described in the specification on

page 6, lines 18-20. Applicants disclosed for the first time the importance of a melanocortinic pathway in the peripheral regulation of energy balance.

Throughout the specification, Applicants compare such peripheral action with central regulation. For example, on page 25, line 25 to page 26, line 19, Applicants state that the body weight of an animal can be regulated in the absence of significantly affecting the appetite of the animal by a POMC compound administered peripherally in an amount effective to act on peripheral receptors while mitigating effects on central receptors.

On page 26, lines 3-19, the specification again describes the peripheral administration of a POMC compound in an amount effective to act on peripheral receptors while mitigating effects on central receptors. These descriptions are directed to peripheral receptors in general and are not limited to MC2-R or MC5-R.

On pages 65 to 75, the specification describes methods used to identify compounds which regulate body weight in an animal, and particularly, compounds useful in the treatment methods described by the inventors. For example, the method described on page 65, lines 1-10 includes selecting compounds which preferentially bind to and/or activate peripheral melanocortin receptors, particularly as compared to the central melanocortin receptor, MC4-R. Although such methods are later illustrated by embodiments where the peripheral receptors are MC2-R and/or MC5-R, the Applicants state that it is the presence of the receptor at the periphery that is critical. For example, on page 26, lines 6-12, the specification states that a POMC compound may be administrated

peripherally in an amount effective to act on peripheral receptors and that this amount is at least one hundred fold less that the amount required to act via the central MC4-R receptor.

For the reasons discussed above, Applicants submit that the specification clearly states that the distinguishing feature of their invention is that the peripheral action of melanocortins is critical in the regulation of energy balance. Applicants further submit that the specification describes methods of identifying compounds that bind to and/or activate peripheral melanocortin receptors and not merely methods directed to the identification of compounds that bind to and/or activate MC2-R and/or MC5-R.

B. At the time of filing, skilled artisans recognized MC1-R and MC3-R as **peripheral** receptors.

The Examiner agrees that the evidence provided on page 7 of Applicant's response to the September 25, 2002 Office Action indicates that the expression of the MC1-R and MC3-R was previously known (Office Action mailed May 19, 2003 – page 2). Applicants submit that the evidence also indicates that these receptors are known to be expressed in the periphery. Applicants also submit that upon reading the specification, skilled artisans would recognize that the peripheral melanocortin receptors discussed above include MC1-R and MC3-R in addition to MC2-R and MC5-R. In support of this, Applicant's submit a Declaration by Dr. Victor J. Hruby pursuant to 37C.F.R. §1.132.

Thus, the specification identifies peripheral receptors as critical in regulating body weight and energy homeostasis and describes MC1-R, MC2-R, MC3-R, and MC5-R as peripheral receptors. The specification also describes assays allowing the identification of compounds that agonize or antagonize peripheral receptors. Therefore, Applicants submit that they are entitled to claim methods of using each of MC1-R, MC2-R, MC3-R, and MC5-R. For the reasons stated above, Applicants request that the Examiner withdraw his 35 U.S.C. §112, first paragraph, written description requirement rejection.

2. Enablement Requirement Rejection

Claims 19–20, 22–29, and 35-37 are rejected under 35 U.S.C. §112, first paragraph, for failing to satisfy the scope of the enablement requirement. The Examiner alleges that although the specification discloses melanocortin receptors MC1-R through MC5-R, the Applicants recognized only MC2-R and/ or MC5-R to be the peripheral receptors with the ability to stimulate lipolysis and/or inhibit fatty acid uptake by adipocytes, and in particular, to control obesity. The Examiner also alleges that the specification fails to provide any guidance to the use of MC1-R and MC3-R in the regulation of body weight and energy homeostasis.

As discussed with respect to the Examiner's written description rejection, Applicants submit that the specification describes MC1-R, MC2-R, MC3-R, and MC5-R as peripheral receptors and identifies peripheral receptors as critical in regulating body weight and energy homeostasis. In addition, pages 65-78 of the

specification contain a detailed description of a number of methods used to identify compounds that bind to and/or activate such peripheral melanocortin receptors. This description includes methods allowing discrimination between melanocortin receptors and the identification of compounds that selectively agonize or antagonize peripheral receptors, including, but not limited to, MC2-R and MC5-R (page 76, lines 23-27).

For the reasons stated above, Applicants submit that they have satisfied the enablement requirement of 35 USC §112, first paragraph. Applicants request that the Examiner withdraw his 35 U.S.C. §112, first paragraph, enablement requirement rejection.

Favorable consideration and allowance of this application are respectively requested for the reasons set forth in the above remarks. If, for any reason, the Examiner is unable to allow the application and feels that an interview would be helpful to resolve any remaining issues, he is respectfully requested to contact the undersigned attorney at (312) 321-4229.

Respectfully submitted,

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